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(71) Applicant(s)
Ō-Lys Limited
(Incorporated in the United Kingdom)
Cumbers House, Gredington, Hanmer, WHITCHURCH,
Shropshire, SY13 3DH, United Kingdom

(72) Inventor(s)
Marianne Broad

(74) Agent and/or Address for Service
Potts, Kerr & Co
15 Hamilton Square, BIRKENHEAD, Merseyside,
CH41 6BR, United Kingdom

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Acc. No. 92-072981 and DE004026327A

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(54) Abstract Title
Skin treatment

(57) A method of treating skin lines comprises the steps of exposing an area of skin to be treated to a first light having a wavelength in the range of 635 to 780 nanometres and exposing the area of skin to be treated to a second light having a wavelength in the range of 500 to 635 nanometres; and a method of treating cellulite comprises the steps of exposing an area of skin to be treated to a first light having a wavelength in the range of 635 to 780 nanometres and exposing the area of skin to be treated to a second light having a wavelength in the range of 400 to 420 nanometres.

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IMPROVEMENTS IN OR RELATING TO COSMETIC TREATMENTS

The present invention relates to improvements in or relating to cosmetic treatments. In particular, the present invention relates to improvements in or relating to cosmetic treatments utilising light therapy.

Light therapy has many applications in the treatment of the human or animal body. The present invention is concerned with the use of light therapy for cosmetic treatment which does not require the specialist skills of a surgeon or doctor.

The present invention provides cosmetic treatments for the treatment of skin lines and cellulite all conditions which are believed to be cosmetically undesirable. In the past, and with a view to treating such treatments, people have resorted to surgery, however, the present invention provides a treatment which does not require invasive treatment of the body by surgery.

Skin lines commonly known as wrinkles, appear on the surface of the human body as a person ages. Many people consider such lines to be undesirable and wish to either remove, or reduce, those lines, or to slow down the development of such lines.

One aspect of the present invention provides a method of treating skin lines comprising the steps of:

exposing an area of skin to be treated to a first light having a wavelength in the range of 635 to 780 nanometres; and

exposing the area of skin to a second light having a wavelength in the range of 500 to 635 nanometres.

In a preferred embodiment, the first light is red light. Preferably, the red light peaks at a wavelength of 660 nanometres.

Further preferably, the second light is yellow light. Preferably, the yellow light peaks at a wavelength of 585 nanometres.

Further preferably, a method of treating skin lines in accordance with the present invention further comprises the step of exposing the area of skin to be treated with a third light having a wavelength in the range of 780 to 900 nanometres. Preferably, the third light is infra-red light. Our research has established that by utilising infra-red light the production of adenosine triphosphate (ATP) is stimulated, which the skilled person will realise is beneficial to the skin. Preferably, the infra-red light peaks at a wavelength of 820 nanometres.

Further preferably, the first light and/or second light and/or third light is modulated or pulsed light, preferably having a frequency of 18 Hz. Our research has established that by utilising modulated or pulsed light, as opposed to continuous light, produces the desired result in a shorter period of time.

Preferably, the first light is applied to the area of skin to be treated for a period of time in the range of 5 to 60 minutes, preferably 15 minutes.

Further preferably, the second light is applied to the area of skin to be treated for a period of time in the range of 3 to 60 minutes, preferably 6 minutes.

Further preferably, the third light is applied to the area of skin to be treated for a period of time in the range of 3 to 60 minutes, preferably 5 to 7 minutes.

Further preferably, the light source producing the first light and/or second light and/or third light is placed directly on to the area of skin to be treated, or within 5 centimetres of same. Preferably said light source is moved in brush strokes over the area of the skin to be treated.

Further preferably, the first light and second light and third light are applied to the area of skin to be treated sequentially.

In a further aspect of the present invention there is provided a method of treating cellulite comprising the steps of:

exposing an area of skin to be treated to a first light having a wavelength in the range of 635 to 780 nanometres; and

exposing the area of skin to be treated to a second light having a wavelength in the range of 400 to 420 nanometres.

In a preferred embodiment the first light is red light. Further preferably, red light peaks at a wavelength of 660 nanometres.

Further preferably, the second light is violet light. Further, preferably the violet light peaks at a wavelength of 405 nanometres.

Further preferably, a method of treating cellulite in accordance with the present invention further comprises the step of exposing the area of skin to be treated to a third light having a wavelength in the range of 500 to 635 nanometres. Preferably, the third light is yellow light. Further preferably, the yellow light peaks at a wavelength of 585 nanometres.

Further preferably, the first light is applied to the area of skin to be treated for 5 to 60 minutes, preferably for 10 minutes.

Further preferably, the second light is applied to the area of skin to be treated for 15 to 60 minutes, preferably for 15 minutes.

Further preferably, the third light is applied to the area of skin to be treated for 3 to 60 minutes, preferably for 6 minutes.

Further preferably, the first light and/or second light and/or third light is modulated or pulsed, preferably at a frequency of 18 Hz. Our research has established that the utilisation of modulated or pulsed light, as opposed to continuous light, produces the desired result in a shorter period of time.

Further preferably, the light source for producing the first light and/or second light and/or third light is placed directly on to the area of skin to be treated or within 5 centimetres of same. Preferably, said light source is moved in brush strokes over the area of skin to be treated.

Further preferably, the first light and second light and third light are applied to the area of skin to be treated sequentially.

One method of each of the above methods of cosmetic treatment will now be described below.

A) Treatment of skin lines

The red, yellow and infra-red light is directed onto the area of the skin to be treated through a flexible or self-supporting fibre optic light guides of fibre bundle diameter in the range of 0.1 mm to 10 mm from a halogen light source from which the thermal component of the bulb output has been filtered out.

A light source suitable for this treatment is an Ö-Lys unit which comprises a halogen lamp rated at 70 to 150 watts and 15 volts and which provides a constant luminous output of between 0 to 60 milliwatts. The unit contains a filter holder into which may be placed selective light wavelength filters. Filtered light from the halogen lamp, having passed through a selected filter, is directed onto the skin through fibre optic light guides.

In order to treat skin lines the Ö-Lys unit is used to direct light at the skin in a specific sequence of wavelengths and with a specific timings as described below:

1. the red light filter is placed into the filter holder of the Ö-Lys unit and then;
2. the said unit is switched on so that a red light of wavelength peaking at 660 nanometres is produced;
3. the fibre optic light guides are then placed directly onto the area of skin to be treated and moved in brush strokes over the said area for a period of 15 minutes;
4. the red light filter is then removed from the Ö-Lys unit and replaced with a yellow light filter so that a yellow light of wavelength peaking at 585 nanometres is produced;
5. the fibre optic light guides are then placed directly onto the area of the skin to be treated and moved in brush strokes over the said area for a period of 6 minutes.

It was observed that the above method causes a reduction in the number of skin lines and/or the depth of the skin lines.

In a preferred embodiment of the present invention the treatment of skin lines is supplemented by further subjecting the area of skin to be treated with infra red light having a wavelength peaking at 820 nanometres for a period of 6 minutes. Such light being applied utilising the Ö-Lys unit with an appropriate infra-red light filter located in the filter holder. Once again, the fibre optic light guides are placed directly on to the area of skin to be treated and moved in brush strokes over the said area to be treated.

Our research has established that the method of treating skin lines as described above can also be used in various medical applications which includes wound healing, in particular, the stimulation of an immune response to fight infection etc., pain relief, seasonal affective disorder (SAD), depression, problems with the synchronisation of the circadian rhythms, for example, jet-lag, stimulation of adenosine triphosphate (ATP), Ischaemic tissues (tissues with insufficient blood supply) Arthritis, sport injuries, bruising, torn muscles, tendinitis and strains of the ligaments, as well as skin diseases for example acne, eczema and postherpetic neuralgia and neurodermatitis.

B) Treatment of cellulite

The apparatus used to provide the desired light source is an Ö-Lys unit that comprises a halogen lamp rated at 70 to 150 watts and 15 volts and which provides a constant luminous output of between 0 to 60 milliwatts. The units contains a filter holder into which may be placed selective light wavelength filters. Filtered light from the halogen lamp having passed through a selected filter is directed onto the skin through two self supporting semi rigid fibre optic light guides.

In order to treat cellulite, the Ö-Lys unit is used to direct light at the skin a specific sequence of wavelength for a specific time as described below:

1. the red light filter is placed into the filter holder of the Ö-Lys unit;
2. the unit is then switched on such that a red light of wavelength peaking at 660 nanometre and is produced;
3. the fibre optic light guides are then placed directly onto the area of skin to be treated and moved in brushstrokes over the said area for a period of 20 to 60 minutes;
4. the red light filter is then removed from the Ö-Lys unit and replaced with a violet light filter such that a violet light of wavelength peaking in the range of 405 nanometres is produced;
5. the fibre optic light guides are then placed directly onto the area of the skin to be treated and moved in brush strokes over the area to be treated for a period of 20 minutes.

It was observed that the above method caused a reduction of cellulite.

In a preferred embodiment of the present invention, the treatment of cellulite is supplemented by further subjecting the area of skin to be treated with yellow light having a wavelength peaking at 585 nanometres for a period of 6 minutes utilising the Ö-Lys unit with the appropriate yellow light filter located in the filter holder. Once again, the fibre optic light guides are then placed directly on to the area of the skin to be treated and moved in brush strokes over the area to be treated.

Additionally, it has been observed that the above method can also be utilised to treat oedema, as well as increase the stimulation of blood circulation. Therefore, it is to be understood that the above method can be utilised to treat any disorder resulting from poor lymph or blood circulation.

In all the above examples of cosmetic treatment, the light can be directed onto the area of skin to be treated through fibre optic light guides having a fibre bundle diameter in the range of 0.1mm to 10mm. It is also to be understood that the light source utilised in any one of the identified methods can be light emitting diodes, preferably super luminous light emitting diodes.

It is also to be understood that when exposing the area of skin to be treated to a light source in accordance with any of the methods of treatment of the present application, it is preferable that the dangerous components of ultraviolet light are screened out from said light source.

CLAIMS

1. A method of treating skin lines comprising the steps of:

exposing an area of skin to be treated to a first light having a wavelength in the range of 635 to 780 nanometres; and

exposing the area of skin to be treated to a second light having a wavelength in the range of 500 to 635 nanometres.

2. A method as claimed in claim 1, wherein the first light is red light.

3. A method as claimed in claim 2, wherein the red light peaks at a wavelength of 660 nanometres.

4. A method as claimed in any one of the preceding claims, wherein the second light is yellow light.

5. A method as claimed in claim 4, wherein the yellow light peaks at a wavelength of 585 nanometres.

6. A method as claimed in any one of the preceding claims, further comprising the step of exposing the area of skin to be treated with a third light having a wavelength in the range of 780 to 900 nanometres.

7. A method as claimed in claim 6, wherein the third light is infra-red light.

8. A method as claimed in claim 7, wherein the infra-red light peaks at a wavelength of 820 nanometres.

9. A method as claimed in any one of the preceding claims, wherein the first light and/or second light and/or third light is modulated light.

10. A method as claimed in claim 9, wherein the modulated light has a frequency of 18 Hz.

11. A method as claimed in any one of the preceding claims, wherein the first light is applied to the area of skin to be treated for a period of time in the range of 5 to 60 minutes.

12. A method as claimed in claim 11, wherein the first light is applied to the area of skin to be treated for 15 minutes.

13. A method as claimed in any one of the preceding claims, wherein the second light is applied to the area of skin to be treated for a period of time in the range of 3 to 60 minutes.

14. A method as claimed in claim 13, wherein the second light is applied to the area of skin to be treated for 6 minutes.

15. A method as claimed in any one of claims 6 to 14, wherein the third light is applied to the area of skin to be treated for a period of time in the range of 3 to 60 minutes.

16. A method as claimed in claim 15, wherein the third light is applied to the area of skin to be treated for 5 to 7 minutes.

17. A method as claimed in any one of the preceding claims wherein a light source for producing the first light and/or second light and/or third light is placed directly on to the area of skin to be treated or within 5 centimetres of same.

18. A method as claimed in any one of claims 6 to 17, wherein the first light and second light and third light are applied to the area of skin to be treated sequentially.

19. A method of treating cellulite comprising the steps of:

exposing an area of skin to be treated to a first light having a wavelength in the range of 635 to 780 nanometres; and

exposing the area of skin to be treated to a second light having a wavelength in the range of 400 to 420 nanometres.

20. A method as claimed in claim 19, wherein the second light is red light.

21. A method as claimed in claim 20, wherein the red light peaks at a wavelength of 660 nanometres.

22. A method as claimed in any one of claims 19 or 21, wherein the second light is voilet light.

23. A method as claimed in claim 22, wherein the violet light peaks at a wavelength of 405 nanometres.

24. A method as claimed in any one of claims 19 to 23, further comprising the step of exposing the area of skin to be treated to a third light having a wavelength in the range of 500 to 635 nanometres.

25. A method as claimed in claim 24, wherein the third light is yellow light.

26. A method as claimed in claim 25, wherein the yellow light peaks at a wavelength of 585 nanometres.

27. A method as claimed in any one of claims 19 to 26, wherein the first light is applied to the area of skin to be treated for 5 to 60 minutes.

28. A method as claimed in claim 27, wherein the first light is applied to the area of skin to be treated for 10 minutes.

29. A method as claimed in any one of claims 19 to 28, wherein the second light is applied to the area of skin to be treated for 15 to 60 minutes.

30. A method as claimed in claim 29, wherein the second light is applied to the area of skin to be treated for 15 minutes.

31. A method as claimed in any one of claims 24 to 30, wherein the third light is applied to the area of skin to be treated for 3 to 60 minutes.

32. A method as claimed in claim 31, wherein the third light is applied to the area of skin to be treated for a period of 6 minutes.

33. A method as claimed in any one of claims 19 to 32, wherein the first light and/or second light and/or third light is modulated.

34. A method as claimed in claim 33, wherein the modulated light has a frequency of 18 Hz.

35. A method as claimed in any one of claims 19 to 34, wherein a light source for producing the first light and/or second light and/or third light is placed directly on to the area of skin to be treated or within 5 centimetres of same.

36. A method as claimed in any one of claims 19 to 35, wherein the first light and second light and third light are applied to the area of skin to be treated sequentially.

37. A method of treating skin lines as claimed in any one of claims 1 to 18 substantially as hereinbefore described.

38. A method of treating cellulite as claimed in any one of claims 19 to 36 substantially as hereinbefore described.

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Application No: GB 9909099.5
Claims searched: 1-18 and 37
Examiner: Peter Davey
Date of search: 22 July 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.Q): A5R (REHR)
Int Cl (Ed.6): A61N 5/00 5/06
Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	WO 97/40888 A1 (GLAXO), see eg. page 5, line 3	1 at least
X	WO 96/33773 A1 (OLAVESEN), see eg. claim 1	"
X	WPI Abstract Acc. No. 98-171406 and FR 2752739 A1 (HOME), see abstract	"
X	Patent Abstracts of Japan JP 8022709 (MATSUSHITA), see abstract	"
X	WPI Abstract Acc. No. 92-072981 and DE 4026327 A (GOLF), see abstract	"

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

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